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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/879,724	06/12/2001	Dong-Hyuk Ju	F0522	4898

7590

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EXAMINER

SEFER, AHMED N

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 10/07/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/879,724

Applicant(s)

JU ET AL.

Examiner

A. Sefer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 July 2002.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 and 17-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 17-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All   b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Response to Amendment***

1. The amendment filed on 7/16/02 has been entered. Claims 11-16 have been cancelled and new claims 18 and 19 have been added.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

3. Claims 1-5 are rejected under 35 U.S.C. 102(e) as being anticipated by Ju US Patent No. 6,424,009.

Ju discloses in fig. 4 a semiconductor-on-insulator (SOI) structure having a semiconductor substrate 412 or silicon (as in claim 2); a leaky, thermally conductive insulator material (LTCIM) layer 414 with a thermal conductivity which falls within the claimed range (as in claim 3) or silicon (as in claim 4) with a resistivity value 10  $\Omega$ -cm or

greater (as in claim 5) disposed directly on the semiconductor substrate; and a semiconductor layer 413 disposed directly on the LTCIM layer; and active region defined in the semiconductor layer by isolation trenches 416 and the LTCM layer.

4. Claims 1-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Chu et al. US PG-Pub No. 2002/0096717.

Chu et al disclose (see fig. 2 page 4, par. 0032 and claim 11) a semiconductor-on-insulator (SOI) structure having a semiconductor substrate 110 or silicon (as in claim 2); a leaky, thermally conductive insulator material (LTCIM) layer 120 with a thermal conductivity which falls within the claimed range (as in claim 3) or silicon (as in claim 4) or undoped single crystalline silicon (as in claims 6 and 7) or porous silicon (as in claim 8) with a resistivity value  $10\ \Omega\text{-cm}$  or greater (as in claim 5) disposed directly on the semiconductor substrate; and a semiconductor layer 413 disposed directly on the LTCIM layer; and active region defined in the semiconductor layer by isolation trenches 142 and the LTCM layer.

5. Claims 1, 2 4, 8 and 9 are rejected under 35 U.S.C. 102(a) as being anticipated by Be (JP 2001-148479).

Be discloses in fig. 2 a semiconductor-on-insulator (SOI) structure having a semiconductor substrate 21 or silicon (as in claim 2); a leaky, thermally conductive insulator material (LTCIM) layer 23b or silicon (as in claim 4) or undoped porous silicon (as in claims 8 and 9) disposed directly on the semiconductor substrate; and a semiconductor layer 25a disposed directly on the LTCIM layer; and active region defined in the semiconductor layer by isolation trenches 33a and the LTCM layer.

6. Claims 17-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Ju US Patent No. 6,424,009.

Ju discloses in fig. 4 a semiconductor-on-insulator (SOI) structure having a semiconductor substrate 412; a leaky, thermally conductive insulator material (LTCIM) layer 414 disposed directly on the semiconductor substrate; and a semiconductor layer 413 disposed directly on the LTCIM layer; a gate 436 defining a channel interposed between a source and a drain formed within an active region of the SOI structure; and the active region defined in the semiconductor layer by isolation trenches 416 and the LTCIM layer.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 2, 4, 6, 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osada (JP 63-288067) in view of Begley et al US Patent No. 5,773,151.

Osada discloses in figs. 1 and 2 a semiconductor-on-insulator (SOI) structure having a semiconductor substrate 21 or silicon (as in claim 2); a leaky, thermally conductive insulator material (LTCIM) layer 3 or silicon (as in claim 4) disposed directly on the semiconductor substrate; and a semiconductor layer 5 disposed directly on the

LTCIM layer; and active region defined in the semiconductor layer by a protective layer 2 and the LTCM layer but does not disclose isolation trenches.

Begley et al disclose in fig. 8 isolation trenches defining an active region.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ isolation trenches, since that would provide a better noise immunity.

As to claims 6, 7 and 10, Begley et al disclose (see col. 1, lines 58-66) an amorphous LTCM layer 84 or undoped single crystalline silicon (as in claims 6 and 7).

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yamazaki (JP 3-34461) disclose an SOI device with a polysilicon and monocrystalline silicon layer formed over a substrate.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Sefer whose telephone number is (703) 605-1227.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on (703) 308-6601.

ANS

September 30, 2002



NATHAN J. FLYNN  
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